

Nov. 23, 1926.

1,607,968

W. H. SPIRE

METHOD OF MAKING ARTICLES HAVING ENLARGED ENDS

Original Filed May 1, 1922

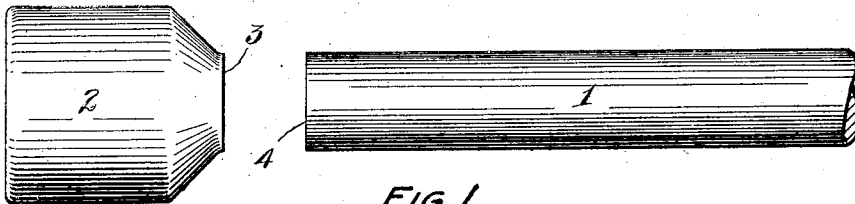


FIG. 1.

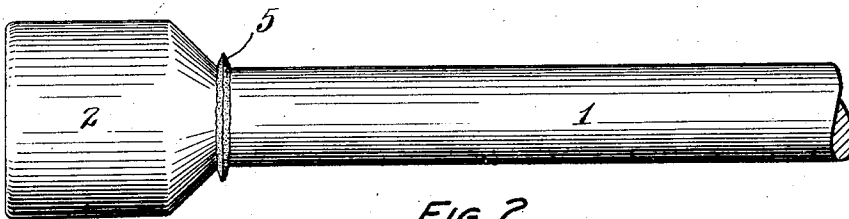


FIG. 2.

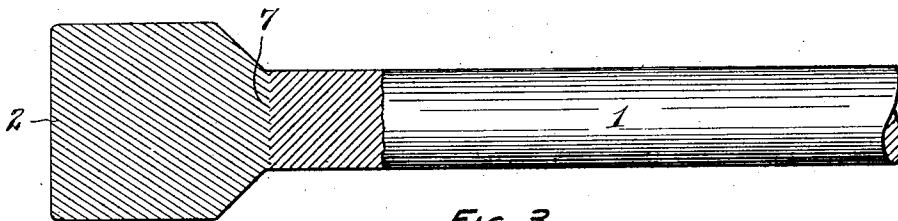


FIG. 3.

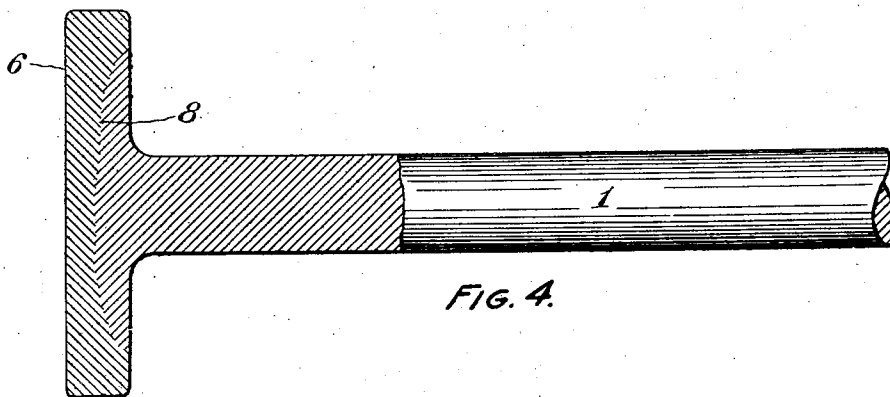


FIG. 4.

INVENTOR:

WILLIAM H. SPIRE

BY

O. Ernest

ATTORNEY

UNITED STATES PATENT OFFICE.

WILLIAM H. SPIRE, OF CLEVELAND, OHIO, ASSIGNOR TO THE STEEL PRODUCTS COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

METHOD OF MAKING ARTICLES HAVING ENLARGED ENDS.

Original application filed May 1, 1922, Serial No. 557,763. Divided and this application filed February 21, 1924. Serial No. 694,372.

My invention relates to the manufacture of articles having enlarged ends, such as, for example, the full-floating type of live axles used in the rear axle construction of some automobiles, poppet valves, or any other mushroomlike construction having an end flange or enlargement.

The object of the invention is to provide a structure of the type above generally described, in an efficient and economical manner.

The broad feature of this invention is disclosed in my pending application, Serial No. 557,763, filed May 1st, 1922, in which it was described in a somewhat modified form as applied to the manufacture of poppet valves and of which this application is a division.

In the annexed drawing I have illustrated one form of article which may be manufactured in accordance with the principles of my invention, the disclosed form, however, constituting but one of the various forms which may be manufactured in accordance with the said principles of my invention.

In said annexed drawing:

Figure 1 represents a side elevation of two blanks, separated, which may be used in connection with the practice of my improved method.

Fig. 2 represents a side elevation of said two blanks after they have been welded.

Fig. 3 represents a side elevation, partly in section, of the two blanks after welding, and after the burr formed by the welding operation has been removed.

Fig. 4 represents a side elevation, partly in section, of the article after the last step included in my improved method has been carried out.

In applying my method to the particular article illustrated by the drawing, I first take a blank bar 1 and a blank head-piece 2. This piece 2 is preferably previously formed, by any suitable means, so as to provide a reduced end portion 3 having a cross-sectional area substantially equal to that of the end 4 of the bar 1. The volume of the piece 2 is made less than that of the required enlargement which is to be provided.

The two ends 3 and 4 are then butt-welded in any suitable manner, preferably by electric welding, whereby they form an extruding burr 5, Fig. 2. This burr is then turned off or otherwise removed. The enlarged end so formed is then forged, as by means of suitable dies, to form the required end enlargement 6, Fig. 4. The forging or other procedure followed in working the end up into the required form is such as will produce an enlargement greater in volume than that of the piece 2. In case dies are used, the volume of the die recess or recesses is made to conform to the required enlargement and is of greater volume than the said piece 2.

As will be noted from an inspection of Fig. 3, the welded area 7 is substantially equal to the cross-sectional area of the bar 1. By making the volume of the piece 2 less than that of the required end enlargement, a portion of the bar 1 adjacent to the welded area is worked into the enlargement. This results in an expansion of the welded area as indicated at 8 in Fig. 4, and also results in a working or molecular manipulation of the metal of the weld.

It will be seen from the above that the strength of the expanded welded area 8 is increased over that of the welded area 7 whereby the strength of the structure is increased as compared with one in which such welded area is not so increased.

What I claim is:

1. The steps in a method of making an article having an enlarged end, which consist in butt-welding to the end of a blank a separate member; reheating the welded portion of said blank and the metal thereof adjacent to such welded portion and heating the said separate member to a predetermined temperature; and then upsetting the reheated and heated metal so as to incorporate a portion of the blank in said separate member whereby an enlargement is formed of a volume greater than that of said member.

2. The steps in a method of making an article having an enlarged end which consist in taking a mass of metal of less volume

than the required enlargement, and having welded area is expanded and the entire end
an end of reduced area, butt-welding said surface of said bar is incorporated in said
end to the end of a bar having an end trans- enlargement.
verse area substantially equal to said re- 10
5 duced area, and then working said mass Signed by me this 31st day of January,
and a portion of the bar adjacent thereto to 1924.
form the required enlargement, whereby the

WILLIAM H. SPIRE.